Performance of Low-Cost Country Sourcing Projects – Conceptual Model & Empirical Analysis

Abstract

Several of the firms have failed to achieve targeted performance in their low-cost country sourcing (LCCS) projects. A clear need exists to understand what drives the performance of LCCS projects and how they can be worked around for achieving the targeted performance. In this study, we evaluate the impact of LCCS project's characteristics on their performance using contingency theory. We collected data from 177 professionals directly involved in LCCS projects in automotive industry and used structural equation modelling for conducting the analysis. Our results convey that LCCS Project characteristics, namely Skill Management, Target Management and Structure Management positively impacts Process Management of LCCS project, which in turn positively drives the Performance of LCCS project. We also find that LCCS project's Strategic Alignment positively impacts Skill Management, Target Management and Structure Management. Results from the analysis have implications for researchers and practitioners attempting to understand and improve the performance of LCCS projects.

Keywords: Low-cost country sourcing, contingency theory, performance measurement, project management, supply chain management, structural equation modeling;

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1. Introduction

Globalization has transformed the business environment to exist with least trading barriers and aligned supply chain with all the partners across the world (Hanna & Jackson, 2015; Gelderman et al., 2016). Due to globalization, global sourcing gained importance as the integration and coordination of procurement requirements on a worldwide basis has become a competitive advantage and strategic requirement of most companies, especially for attaining cost advantages (Quintens et al., 2006a). Supporting this observation, the amount of goods and services sourced from low-cost country suppliers has been consistently increasing since early 1980s (Christopher et al., 2011; Gelderman et al., 2016). Research and practice have been continuously reporting the importance and increase in low-cost country sourcing (LCCS) initiatives both in extent as well as in focus (Kotabe & Swan, 1994; Christopher et al., 2011; Gelderman et al., 2016).

At the same time, LCCS has been ranked as one of the most challenging topics for procurement professionals (Kusaba et al., 2011). Companies have been experiencing mixed outcomes with LCCS initiatives (Vos et al., 2016). The management literature presents therefore contradictory views concerning the overall benefits of LCCS (Horn et al., 2013). While some articles report that LCCS leads to competitive advantages through cost savings, purchase price reduction, service enhancements, delivery cycle and quality improvements, defect rate reductions, or new market penetration (e.g. Petersen et al., 2000; Trent & Monczka, 2005; Horn et al., 2013; Jia et al., 2014), others highlight the problems and financial losses associated with LCCS projects (e.g. Kusaba et al., 2011).

Accordingly, one major objective of global sourcing research is aimed at identifying and understanding the LCCS project characteristics that drive LCCS project performance.

Antecedents of global sourcing in general and LCCS in specific have been investigated in the past (Quintens et al., 2006b). They have been classified into drivers that improve global sourcing decision making, facilitators that ease its implementation and barriers that make it more difficult or even impossible to pursue or intensify global sourcing activities (Quintens et al., 2006b, p.173). However, most of the studies are descriptive without relating the identified factors to each other, explaining the observable phenomena, or investigating the consequences and outcomes of LCCS (Vos et al., 2016). Consequently, research that models the relationship between the characteristics of LCCS project and studies the relative effects of those characteristics on LCCS project's performance is absent. Therefore, the overarching research question that this study attempts to answer is *"what drives the performance of LCCS projects and how they can be worked around for achieving the targeted performance"*.

Our research is motivated by this gap in the literature and attempts to analyze the impact of *LCCS project characteristics* on *Performance*. Using contingency theory, we formulate specific hypotheses capturing the fit within *LCCS project characteristics* and relationships between *LCCS project characteristics* and *LCCS project Process Management* and *Performance*. We collected data from 177 professionals directly involved in LCCS in automotive industry to empirically test the hypotheses. We used Partial Least Squares-Structural Equation Modeling (PLS-SEM) technique for conducting the analysis.

Our analysis showed that (a) *Strategic Alignment* of LCCS project positively drives *LCCS project characteristics*, namely *Skill Management*, *Target Management*, and *Structure Management*, (b) *LCCS project characteristics* positively drives *Process Management* of LCCS project, and finally (c) *Process Management* of LCCS project positively drives the *Performance* of LCCS project.

The remainder of this paper is organized as follows. In the next section, we present the review of relevant literature. Section 3 describes the theory and formulation of hypotheses. In

section 4, we outline our research design and methodology, including data collection, measurement scale development, and analytical procedure. In section 5, we present and discuss the results of our analysis. Finally, in the last section, we summarize the key findings, research and managerial implications stemming from the results of our analysis, and propose directions for further research.

2. Literature Review

In this section, we review the literature that addresses the topic of LCCS by specifically focusing on LCCS project characteristics and performance, and position our study relative to prior research.

2.1 LCCS project characteristics

Quintens (2006b) reviewed the published literature on global purchasing in the period 1990–2005 and presented the antecedents of global purchasing, of which several can be categorized into key success factors of global purchasing projects. Therefore, we relied on Quintens (2006b) review article for identifying project characteristics from literature published till 2005 (Appendix 1 presents the overview of LCCS project characteristics in the literature published till 2005) and in the following paragraphs we document the review of papers published from 2006.

One stream of literature have discussed the strategic aspect of outsourcing. Hätönen and Eriksson (2009) reviewed the development of outsourcing strategy and Javalgi et al. (2009) reviewed offshoring and outsourcing to emerging markets literature. Holcomb and Hitt (2007) explained the conditions that can lead to strategic outsourcing, whereas Hanna and Jackson (2015) examined the strategic and operational impact of global sourcing. Following it, Gelderman et al. (2016) enquired how companies were reaching higher levels of

global sourcing and explained the role played by critical incidents in the process. Research have also developed frameworks and approaches for outsourcing (Varadarajan, 2009), global sourcing decision-making (Holweg et al., 2011), and emerging country sourcing (Najafi et al., 2013).

Another stream of literature have focused on the impact of LCCS on the procurement process and performance. Studies have investigated the impact of different measures such as LCCS competence of employees (Kusaba et al., 2011), low-wage country suppliers (Ruamsook et al., 2009; Vos et al., 2016), alignment of governance structure and sourcing region distance (Schneider et al., 2013) on performance indicators such as logistics performance (Ruamsook et al., 2009; Kumar et al., 2010), total cost of ownership (Weber et al., 2010), procurement transaction performance (Schneider et al., 2013), and competition within industrialized country supply base (Vos et al., 2016).

Based on the review conducted, we grouped the key factors to identify different LCCS project characteristics (as listed in Table 1) such that it captures the internal conditions of firms that source from low-cost countries, specifically those characteristics from a LCCS project's team perspective.

Insert Table 1 here

2.2 LCCS project performance

Kotabe and Murray have published several articles on LCCS performance measures analyzing the effects on strategic and financial dimensions of market performance at the product level (e.g., Kotabe, 1992; Kotabe and Swan, 1994; Murray et al., 1995; Kotabe et al., 1998). Mol et al. (2005) replicated these measures and investigated the effect of five technological contingency factors on the scope and depth of global sourcing. Petersen et al. (2000) measured global sourcing performance through a variable named global sourcing

effectiveness, which measured the perceived effectiveness of strategies and practices related to business unit's global purchasing and supply chain. Samli & Browning (2003) claimed that it was almost impossible to connect international sourcing to corporate profit measures and therefore, used perceptional measures to evaluate the impact of sourcing activities. Other LCCS performance measures used in the literature are operational supply chain performance (Fredriksson and Jonsson, 2009), firm's logistics performance (Ruamsook et al., 2009), savings from global sourcing (Horn et al., 2013), procurement transaction performance (Schneider et al., 2013), product recalls (Steven et al., 2014), quality inspection cost (Hanna and Jackson, 2015), supply chain administration cost (Lorentz et al., 2015), value of inputs supplied by independent foreign suppliers divided by total sales (Lahiri, 2016), total cost of ownership (Vos et al., 2016), etc. Table 2 documents the LCCS project performance measures identified from the literature review.

Insert Table 2 here

2.3 Research gap

Published literature fails to provide a clarity on the relationship between *LCCS project characteristics* and *LCCS project performance*. On one hand, Kotabe (1992) concluded that internal sourcing of crucial components is related positively to finished good's market performance, but the location aspect of global sourcing is unrelated to a product's market performance. Supporting Kotabe (1992), Murray et al. (1995) reported that the domestic component of purchasing has significantly larger impact on firm performance than its foreign component. On the other hand, Kotabe and Swan (1994) found the extent of offshore sourcing to be positively related to both global market share and the propensity to innovate. Kotabe et al. (1998) found the findings in Kotabe (1992) to be only valid in the context of manufacturing firms but not in the case of services where results showed that foreign

sourcing of supplementary services to be negatively related to strategic and financial dimensions of a service firm's market performance. Other researchers like Contractor et al. (2010), Horn et al. (2013), Steven et al. (2014), Tate (2014), and Töyli et al. (2015) analyzed effects of global sourcing on the supply chain and found negative results. By reviewing 57 articles that empirically investigate the outsourcing-firm performance relationship, Lahiri (2016) found that outsourcing can produce positive, negative, mixed, moderated or no significant impact on the firm performance. For a detailed explanation on the inconsistent impact of outsourcing on the firm performance, refer to Lahiri (2016).

Therefore, the literature review presented in this article confirmed two aspects – (a) prior research has identified a large number of factors that are potentially critical for the success of LCCS efforts, and (b) LCCS performance outcomes have been measured by various means with differing outcomes. A tension exists in literature on the performance of LCCS projects. In addition, the review identified lack of research in (1) relating the LCCS project characteristics to each other, and (2) identifying their individual impact on performance of LCCS projects. Drawing from this existing body of literature, we conceptualize the central constructs of this study and formulate hypotheses using the lens of contingency theory in the next section.

3. Theory and Hypotheses

Contingency theory is built on the reality that no theory or method can be applied in all instances and therefore there is no one best way to design an organization (Lawrence and Lorsch, 1967; Flynn et al., 2010). By employing reductionist approach, contingency theory treats organization as an entity that can be decomposed into independent smaller elements. The environment in which the organization operates shapes these independent smaller elements to maximize performance. In the context of the current study, low-cost country

environment shapes LCCS project characteristics and process management to maximize its performance. Therefore, we use contingency theory in this study to understand the drivers of LCCS project performance.

Fourteen global sourcing experts from North America, Europe and Asia were interviewed (Appendix 2 presents the interview protocol adopted) for about 90 minutes to understand the major drivers as well as barriers of LCCS project success. Interview responses were backed by their rich experience and additional insights gained through professional knowledge exchange with colleagues in LCCS project management. All experts had at least five years of actual working experience in LCCS. Experts were asked questions related to the identified constructs with an objective to validate their importance and to update it with any missing insights. The findings from the interviews were used along with theoretical arguments to understand LCCS project characteristics and finally propose a LCCS Project Performance model. This model was once again discussed in detail with experts to understand the appropriateness of our constructs, the importance of each of them and its relationship to others. In a last step, we introduced our model at two roundtables with five and six CPOs each in Germany and the U.S. These interactions did not substantially change our proposed model, but confirmed its relevance and comprehensiveness. The definitions of the constructs used as well as the rationale behind the relationships in LCCS Project Performance model are outlined in the following subsections. Figure 1 presents the LCCS project performance model with the hypotheses linkages proposed in this study.

Insert Figure 1 here

3.1. LCCS Project Strategic Alignment

According to Structural contingency theory (Lawrence and Lorsch, 1967; Flynn et al., 2010), performance of a project depends on the extent to which the strategy that it seeks to

pursue is in alignment with corporate objectives, overall sourcing strategy and other functional strategies (also described as “fit”). A clear strategy or plan as well as an advanced understanding of global sourcing opportunities are among the most important elements for successful sourcing activities from low-cost countries. To develop a comprehensive LCCS strategy, the current sourcing performance has to be understood and the expected goals from the LCCS initiative as well as measurements quantifying and reporting its continuous progress have to be defined. For this purpose, Quintens et al. (2006a) defined a third-order construct on global purchasing strategy with four dimensions labeled as configuration and standardization of the global purchasing process as well as standardization of product-related and purchasing personnel-related characteristics.

In line with contingency theory, development of a LCCS strategy for a specific project requires a differentiated strategy depending on the products or services involved and the scope of the project. In any case, commodity-specific risks and opportunities as well as potential savings have to be weighed against the complexity of LCCS. Finally, as highlighted in our expert interviews, a LCCS project strategy cannot be implemented independently of other strategies in the company. Thus, a LCCS project strategy needs to be aligned and embedded vertically at least in a company's purchasing and global sourcing strategy but also requires intensive horizontal integration and coordination of the other involved functions such as research and development, manufacturing, logistics, quality control or marketing (Rizza, 2007). Our expert interviews also confirmed that the alignment of LCCS project strategy with corporate objectives, overall sourcing strategy and other functional strategies is an important prerequisite. Therefore, this LCCS project strategic alignment serves as the primary performance enabler in our model.

3.1.1. LCCS Project Strategic Alignment & LCCS Project Skills Management

After defining a comprehensive LCCS project strategy, sourcing from low-cost countries require a broad set of skills including specific knowledge of the supplier base capabilities in different countries, cross-cultural communication and negotiation expertise, international logistics and customs processes, currency exchange rate developments, etc. (e.g., Quintens et al., 2006b). Several authors as well as our experts interviewed emphasize the importance of skilled staff in LCCS projects (Trent & Monczka, 2005). The required skills may vary from project to project and if needed, the involved employees have to be trained accordingly. Besides general buyer characteristics, the skills required for LCCS projects include business intelligence on selected countries, multi-language and cultural capabilities, and knowledge of foreign/domestic trade regulations (Faes et al., 2001; Petersen et al., 2000). According to contingency theory, internal fit indicates consistency between strategic alignment of the project and characteristics within a project. A LCCS project which is strategically aligned would make the skills management of the project much easier due to the past experience and learning curve with other projects. Thus, we hypothesize:

H1a: LCCS Project with Strategic Alignment will be higher on its Skills Management than those lacking Strategic Alignment.

3.1.2. LCCS Project Strategic Alignment & LCCS Project Target Management

Similar to the above formulated hypothesis, a strategy cannot be successfully executed without adequately managing set goals. In this regard, Trent & Monczka (2005) defined structured approach to communication as one of the characteristics of global sourcing excellence. Nothing undermines change in an organization more than the behavior of managers that is inconsistent with their statements (Faes et al., 2000). The leadership team in any LCCS project has to apply well-established target communication methods and mechanisms to enforce and encourage the sourcing efforts of their project teams. In addition,

the LCCS project's progress and the benefits gained from each LCCS effort have to be measured on a regular basis, success stories have to be communicated to both team members involved in the LCCS effort and any company member, and corrective actions have to be applied to create an environment of continuous improvement (Trent & Monczka, 2005). Similarly, the performance of suppliers involved in LCCS projects has to be monitored, tracked and regular feedback has to be given. A LCCS project which is strategically aligned would naturally be able to manage its goals as the systems for target monitoring will already be in place. Thus, we hypothesize:

H1b: LCCS Project with Strategic Alignment will be higher on its Target Management than those lacking Strategic Alignment.

3.1.3. LCCS Project Strategic Alignment & LCCS Project Structure Management

Strategic alignment recognizes that different departments and functional areas involved in sourcing process from different firms across the supply chain should operate as part of an integrated structure (Flynn et al., 2010). Accordingly, Petersen et al. (2000) included sourcing structures into their global sourcing effectiveness model and confirmed that they have a positive influence on the development of global sourcing business capabilities. Any sourcing organization should reflect the requirements of LCCS projects in both role definitions as well as responsibilities and organizational linkages. Trent & Monczka (2005) characterized supportive organizational global sourcing design as one that separates strategic and operational activities, forms cross-functional global sourcing project teams, and links sourcing support personnel organizationally to the appropriate global sourcing teams. In this regard, several authors recommend the establishment of international purchasing offices (IPO) in the supply markets to better identify suppliers, negotiate, manage and obtain local support (Forrest, 2005). Firms being strategically aligned breaks functional barriers to

encourage cooperation through structure management for meeting the requirements of customers, rather than operating for individually optimizing the functions, which is associated with traditional departmentalization and specialization (Flynn et al., 2010). Thus, we hypothesize:

H1c: LCCS Project with Strategic Alignment will be higher on its Structure Management than those lacking Strategic Alignment.

3.2. LCCS Project Process Management

After having defined an aligned strategy for a LCCS project with required skills, goals and structure management, the actual sourcing process begins with an objective to transform strategy into action. Trent & Monczka (2005) listed rigorous and well-defined processes as one of the critical success factor. These are especially crucial for the collaboration with suppliers from low-cost countries.

Low-cost countries require fundamentally different supplier management and relationship processes. Literature proposes a wide range of supplier selection criteria in order to define optimal supplier identification, evaluation and selection processes (e.g., Quintens et al., 2006b; Sarkis & Talluri, 2002). Processes with regular business communication and involvement of suppliers is of primary importance in LCCS due to the longer physical distance to the suppliers (Tracey & Tan, 2001). Developing partnerships is one of the most important process in building and maintaining customer-supplier relationships. For example, supplier conferences are often conducted to increase the personal linkage between purchasers and suppliers. An increasing number of firms already join hands with suppliers at the development stage and share resources such as information technology and development knowhow to jointly improve performance. Furthermore, there is a willingness of purchasers to rely more on suppliers to design and build entire subassemblies and subsystems.

According to structural contingency theory, external fit in this study indicates consistency between project characteristics (skills, target and structure) and the process management in response to its external environment containing suppliers from low-cost countries. As its external environment changes, a LCCS project responds better in selecting, developing and implementing process changes to maintain fit with its external environment if it has higher skills, target, and structure management capabilities. Therefore, we hypothesize that:

H2a: LCCS Project with Skills Management will be higher on its Process Management than those lacking Skills Management.

H2b: LCCS Project with Target Management will be higher on its Process Management than those lacking Target Management.

H2c: LCCS Project with Structure Management will be higher on its Process Management than those lacking Structure Management.

3.3. LCCS Project Performance

Contingency theory suggests that attaining internal fit enhances external fit, which in turn maximizes the performance of LCCS projects (Lawrence and Lorsch, 1967; Flynn et al., 2010). Achieving external fit ensures that all supportive processes such as low-cost supplier selection, risk sharing, integrated decision making and target tracking, etc. are in place, which directly improves the LCCS project performance. Therefore, we hypothesize that,

H3: *LCCS Project with Process Management will be higher on its Performance than those lacking Process Management*

4. Research design and methodology

4.1 *Survey instrument*

To validate the theoretical constructs and the conceptual model built in the previous section, a questionnaire was developed by anchoring to the reviewed literature. Prior to data collection, the initial survey instrument was pre-tested for content validity. A panel of researchers and practitioner experts were asked to assess the questionnaire regarding its structure, clarity, ambiguity, appropriateness, and completeness. The questionnaire was then modified according to their input. While the five main constructs were confirmed by the experts, items of constructs were extended and/or adjusted. For example, the importance of alignment of the LCCS strategy within the company was highlighted to a greater extent than what we had found in the literature. In addition, the need of an appropriate organizational structure support for each LCCS project was concretized by dividing this project characteristic into two items - definition of roles and the relationship between the roles/departments. Also, the LCCS project process management construct was further detailed out in terms of various stages in the creation and maintenance of supplier relations.

The measurement of LCCS project performance using market performance measures such as financial or strategic indicators is challenging and constraining because they are incapable of directly associating with individual LCCS project initiatives. In addition, it is generally very difficult to obtain objective data on a firm's operational and financial issues (Narasimhan et al., 2001). We, therefore, decided to measure LCCS project performance by each respondent's perception of the impact of LCCS project. This approach is in accordance with Samli and Browning (2003) and Kusaba et al. (2011) who not only confirmed that it is generally challenging to directly associate LCCS initiatives to profitability outcomes but also made use of perceptional variables to determine the success or performance of LCCS efforts. Table 3 lists the indicators underlying each construct as measured in the questionnaire with the supporting literature. A 5-point rating scale ranging between "strongly agree" and "strongly disagree" was used to measure all items.

Insert Table 3 here

4.2 *Data collection*

The field study was conducted among a sample of five large firms in the automotive industry with respondents almost equally distributed across the firms. For each company, the Chief Purchasing Officer (CPO) identified a list of people that were involved in one of the company's LCCS project teams. In a formal letter to the employees, the CPO explained the research project's objectives, survey content as well as the CPO's reason to participate in this research effort. Next, each participant received an intranet link and a customized password to the survey, which was valid for two weeks. During that time, the CPO was informed about the progress of received responses, so that a general reminder could be sent to the employees if necessary.

The study's high response rate of more than 90% was primarily possible due to the support from upper management and the conduction of in-company review sessions, where the study results were presented and discussed after the completion of the survey. This makes a non-response bias analysis less critical to this study. However, as in any cross-sectional study, common method variance (CMV) is an issue and can account for a substantial part of the variance in research. As the data for both the predictor and criterion variables were collected from one source, several proposed techniques from Podsakoff et al. (2003) to minimize CMV including a temporal separation of the measures and strictly protecting the respondents' anonymity were implemented. In addition, Tourangeau et al. (2000) suggested methods to improve scale items were incorporated. Finally, we tested for CMV similar to Wallenburg (2009) to confirm the absence of any substantial indication for CMV in the data.

The respondent profile characteristics are presented in Table 4. While more than half of the 177 respondents were regular employees, the other half of the respondents were from

senior or middle management and supervisor level. In terms of functional classification, half of the respondents were from the purchasing department, while the other half was from functions like R&D (16%), supply chain and logistics (12%) and manufacturing (7%).On average, the respondents had a relatively high tenure with only 21% of the respondents having less than 5 years and 50% with already more than 10 years in the participating company. Respondents were primarily involved in LCCS efforts through the use of remote business communications with their LCCS suppliers (50%) or business trips to the targeted LCCS regions (25%).

Insert Table 4 here

4.3 *Analysis*

We analyzed the measurement model using partial least squares (PLS). PLS is a multivariate analysis technique that weighs indicator loadings on constructs in context of the theoretical model as a whole rather than in isolation (Hulland, 1999). It is a variance-based method that places minimal demands on measurement scales and distribution assumptions and uses least-square estimation. Designed to explain variance, PLS analysis is more suitable for predictive research scopes and theory building than theory-based hypotheses testing. In addition, PLS avoids problems inherent in small sample sizes and provides more conservative estimates of the individual path coefficients compared to traditional co-variance-base techniques such as LISREL (Chin, 1998; Hulland, 1999; Henseler et al., 2009)

As we are testing formative measurement model containing composites with data dependent weights, we used PLS analysis as recommended in literature (Diamantopoulos & Siguaw, 2006; Goodhue et al., 2012; Henseler et al., 2016). Also, PLS analysis is recommended to be an appropriate method if the primary objective involves predicting a dependent variable (Reinartz et al. 2009). As the research objective of our study is to develop

a model that can predict the LCCS project performance based on the values of different LCCS project related attributes, PLS analysis is a direct fit. Therefore, PLS analysis is believed to be the most appropriate technique for our study's objectives.

A PLS model consists of the following sets of relations: (i) the structural model specifying the relationships between the constructs; (ii) the measurement model specifying the relationships between the constructs and the observable indicators; and (iii) the weight relations based on which the case values for the constructs can be estimated (Chin, 1998). Unlike covariance-based techniques, PLS does not use fit indices. Instead, a good model fit is established with significant path coefficients and acceptably high R^2 values and construct reliability (Chin, 1998; Hulland, 1999). Several software packages support PLS; we used SmartPLS version 2.0 (Ringle et al., 2005).

Indicator reliability was tested using bootstrapping (Henseler et al., 2009). As shown in Table 5, all estimates of the outer loadings exceed or at least equal the recommended minimum value of 0.7 and exhibit sufficient t-values (Fornell & Larcker, 1981). To assess *construct reliability*, Cronbach's alpha value (α) and composite reliability (CR) are determined. As depicted in Table 5, the α-values for the constructs range between 0.67 and 0.86, which is above the threshold value of 0.6 (Litwin & Fink, 1995). CR measures the inter-item consistency. The CR values range between 0.82 and 0.90 and are therefore all well above their suggested threshold value of 0.7, suggesting that each scale has excellent reliability (Henseler et al., 2009).

Insert Table 5 here

Construct validity is assessed by its three sub-dimensions: content validity, convergent validity and discriminant validity. The first, *content validity*, does not have a formal statistical test, but was addressed in this study by a thorough theoretical foundation of the model, its items and its constructs and rigorous review of the survey instrument by a panel of both

academic and practitioner experts. The second, *convergent validity*, was assessed simultaneously while testing indicator reliability where loadings greater than 0.7 imply that the indicators share more variance with their respective constructs than with the error variances (Chin, 1998). It was also assessed using the average variance extracted (AVE) measure. High values for AVE indicate that the items share more than half of the variance of the respective constructs. As depicted in Table 5, the AVE is in all cases (between 0.53 and 0.67) above the recommended value of 0.5 (Fornell & Larcker, 1981; Chin, 1998; Henseler et al., 2009). Lastly, we assessed *discriminant validity* in order to address the potential problem of having one construct overlap the defined area of another construct. One criterion for adequate discriminant validity is that each item should load highest on the construct it is intended to measure. Cross loadings are presented in Table 6 with each item loading highest on its respective construct.

Insert Table 6 here

Additionally, following the procedures outlined in Fornell & Larcker (1981), we calculated the squared correlations between the constructs. Discriminant validity is obtained when all values are significantly different from 1 (Hulland, 1999), which is the case for all our constructs indicating that each construct is sufficiently distinct from each other (see Table 7).

Insert Table 7 here

5. Results and Discussion

The results from the *evaluation of the structural model* are shown in Figure 2 and reported in Table 8. Our model explains 35% of the variance observed in LCCS Project Performance. In addition, 70% of the variance in Skills Management, 62% of the variance in Target Management, 69% of the variance in Structure Management, and 79% of the variance

in Process Management are explained through the model. According to Chin (1998), the R^2 values of the variables Skills Management ($R^2 = 0.70$), Target Management ($R^2 = 0.62$), Structure Management ($R^2 = 0.69$), and Process Management ($R^2 = 0.79$) are substantial, while the R^2 value of LCCS Project performance ($R^2 = 0.35$) is moderate from a statistical point of view. However, for our specific context, an R^2 of 0.35 can be considered quite substantial as there are several other external factors that can impact the performance of LCCS projects. The significance of the relationships among the latent variables is tested by the associated t-statistics obtained from PLS bootstrapping. The results show (see Table 8) that all relationships are significant at the 0.01 level supporting all the hypotheses proposed in this study. Overall, the results indicate a good model fit with substantial effects and predictive power.

Insert Figure 2 here

Insert Table 8 here

5.1 *Hypotheses testing*

The results show that the path coefficients outgoing from the *LCCS Project Strategic Alignment* are strong, positive and highly significant. *LCCS Project Strategic Alignment* has a strong impact on the three other project characteristics which act as driving factors, namely *Skills Management* (b=0.84), *Target Management* (b=0.79), and *Structure Management* (b=0.83) of LCCS project. Therefore, our hypotheses H1a, H1b and H1c are supported. It is especially interesting to notice that the impact on all three variables is nearly equally strong. In addition, even though there are other factors, be it internal or external, that might influence the three drivers of our model, 62% to 70% of the variance is already being explained by the *LCCS Project Strategic Alignment*. This result highlights about the importance of a thoroughly developed *LCCS Project Strategic Alignment*, which is differentiated depending

on the main commodities involved, has clearly defined current costs and potential targets, and ensures alignment within the rest of the organization. Without such a strategy in place, neither skills, nor targets or structures are to unfold their full potential and indirectly lead to *LCCS Project Performance*. The high relevance of the strategic alignment for the success of a LCCS project becomes additionally apparent when comparing the top performing quarter of our sample with the low performing one: their *LCCS project strategic alignment* differs substantially with mean values of 3.33 and 2.31 (Table 9 and Table 10). As a result, our proposed model adds additional insights to prior models like those from Petersen et al. (2000).

Insert Table 9 & Table 10 here

Analyzing the path coefficients from the enabling project characteristics to the performance driving project characteristics, the results show that the path coefficient from *Skills Management* to *Process Management* of LCCS Project is positive and significant (b=0.20). These LCCS project skills include knowledge about the relevant supplier base, available skills and trainings as well as cross-functional support. It can be thus stated that the better a LCCS project is equipped with the relevant LCCS project skills, the more likely that the *LCCS Project Process Management* excels, lending support for hypothesis H2a.

Likewise, the path from *Target Management* to *Process Management* of LCCS Project is also statistically significant with a positive path coefficient. This implies that LCCS projects having superior target management with clear communication of expectations, performance progress management, and regular checking of suppliers have a strong impact on LCCS processes of supplier management. Hence, hypothesis H2b is also supported.

Moreover, compared to the impact of *Skills Management* on *Process Management*, the path coefficient of *Target Management* on *Process Management* of LCCS Project is twice the magnitude (b=0.42). On one hand, these results indicate *Skills Management* of LCCS Project

as a LCCS enabling project characteristic that has fostered high attention among practitioners with its components being determined and emphasized in various existing frameworks. On the other hand, *Target Management* of LCCS Project is a comparatively less discussed dimension, which varies broadly across LCCS project teams. Consequently, the results suggest that a larger potential for improvement lies in the area of *Target Management* and that improvements in this area will have a strong overall impact on *Process Management* level of LCCS Project and finally on LCCS Project *Performance*. The higher standard deviation (0.90 vs. 0.69; see Table 11) and higher differences between the high and low performing group (3.41-2.47=0.94 vs. 2.90-2.08=0.82) also seems to confirm the differentiation potential of this project characteristic between low and high LCCS project performers. However, the analysis also hints that with an average of 2.47 and a standard deviation of 0.69, *Skills Management* of LCCS Project is substantially less rated than any other project characteristic, implying that excelling in this area is a challenging endeavor that only few LCCS projects are currently able to manage.

Insert Table 11 here

Structure Management of LCCS project also shows a positive and significant relationship with *Process Management*. This lends support for hypothesis H2c. Even though lower than the one between *Target Management* to *Process Management*, this path coefficient is still high (b=0.34) to contemplate about the potential that lies in improving the definition of clear roles and relations within a LCCS project team as well as with other departments both at headquarters and in the low-cost countries (e.g. in IPOs). In sum, the results of our data analysis show that the enabling LCCS project characteristic (skills, target, and structure) are indeed strongly associated with *Process Management* of LCCS Project as key performance drivers. Moreover, nearly 80% of the variance in *Process Management* construct is explained by these three LCCS project characteristics.

The path coefficient between *Process Management* and *LCCS Project Performance* is positive and statistically significant with a value of 0.5. *Process Management* is defined as the executor variable for *LCCS Project Performance*. This implies that LCCS projects having a superior *LCCS Project Process Management*, including the first contacting of potential suppliers and their evaluation to the maintenance of the relationship and establishment of joint performance improvement task forces, excel in their *LCCS Project Performance*. Therefore, hypothesis H3 is also supported. A comparison between the different performing groups complements this finding: average rating of *LCCS Project Process Management* for the highest performing group is at 3.52 (standard deviation of 0.62), while the lowest performing group achieves on average a much lower assessment of 2.46 (standard deviation of 0.89).

5.2 *Implications*

In the beginning of this paper, we addressed the need for defining and investigating project characteristics that determine LCCS project performance using contingency theory. We argued that firms sourcing from low-cost countries have to work on aligning its project characteristics to achieve higher competencies to show higher LCCS project performance (e.g., Narasimhan et al., 2001). Our findings provide evidence that the identified project characteristics support the strategic and operational preparedness of LCCS project teams towards successful execution of LCCS project tasks. In addition, our study provides insights on how these management areas and methods can contribute to LCCS project performance using the lens of contingency theory.

Few studies in literature have developed approaches for assessing LCCS (Fredriksson and Jonsson, 2009; Christopher et al., 2011). Our research contributes to this LCCS assessment literature by identifying the different sourcing project characteristics that needs to

be considered while conducting the assessment. Literature have also specifically focused on studying sourcing aspects in service firms (Kotabe et al., 1998; Manning et al., 2008; Gleich et al., 2016). They have found that findings valid in the context of manufacturing firms differ in the case of services, but the beneficial effects of LCCS continue to persist. Future research could validate the LCCS Project Performance model proposed in this study in service context using contingency theory. As the project characteristics identified hold very well relevant in the service sector, testing the validity of the model in different service contexts can be expected to have interesting implications.

Of late, many studies have documented the negative impact of global outsourcing and discussed the concept of reshoring. By considering that further scattering of value chain activities entail benefits as well as increases complexity and costs, Contractor et al. (2010) evaluated each firm's optimal degree of disaggregation and global dispersion after studying their offshoring (geography) and outsourcing (organization) strategies. By analyzing secondary data from a company data warehouse, Horn et al. (2013) found that more than three quarters of the analyzed China-sourcing projects failed to reap the expected benefits and they had to suffer high costs by resorting back to suppliers from high-wage countries. Steven et al. (2014) examined the impact of supply chain sourcing strategies such as outsourcing, offshore outsourcing, offshoring, supply base concentration, etc. on product quality recalls and found that offshore outsourcing has a greater impact on recalls than offshoring without outsourcing and outsourcing domestically. Lorentz et al. (2015) found that the supply chain administration cost among manufacturing firms increased with the increase in LCCS. Tate (2014) and Di Mauro et al. (2018) discuss current offshoring and reshoring (or backshoring) trends and associated motives with challenges. Future research can extend the current study by investigating successful LCCS projects and sourcing projects that ended up in reshoring to identify the role of LCCS project characteristics in the outcome.

Manufacturing competitively in high cost environment has attracted recent attention (Ketokivi et al., 2017; Yin et al., 2017; Di Mauro et al., 2018). Recent studies have focused on production processes (Ketokivi et al., 2017; Yin et al., 2017), location choices (Ketokivi et al., 2017), and motivation for backshoring (Di Mauro et al., 2018) in high-cost environment and have not described how sourcing projects are actually executed in high-cost environment to remain competitive. Therefore, it will be of value for both research and practice audience to understand how high-cost country sourcing (HCCS) projects have to be executed (e.g. supply management processes, target definitions, skills management, etc.) using contingency theory for achieving high performance. Given this increasing attention to operate in high-cost environment, study comparing the performance of standalone LCCS projects with HCCS (no history of reshoring) and the impact of individual project characteristics will be an interesting avenue for future research.

5.3 *Contributions*

As argued before, although LCCS has received high attention in the academic and managerial literature, outcomes are still mixed and the implementation of a LCCS project strategy lacks a structural approach. Well-defined measurement methods and clear evidence help to translate LCCS into a worthwhile business case that justifies respective investments. To the best of our knowledge, this is the first empirical study that comprehensively combines strategic and operational project characteristics in one model and explains its impact on LCCS Project Performance using contingency theory. Thus, the proposed model and the empirical validation have significant contributions to theory and practice.

Firstly, through our extensive review of the global sourcing literature in general and the LCCS literature in particular, combined with insights from several expert interviews, we detailed out constructs that cover all main generalizable project characteristics that has an

impact on LCCS Project Performance. Our data analysis with PLS supports the importance of these project characteristics for high LCCS Project Performance as the model succeeds to explain between 35% to 79% of the observed variances in our model. Therefore, the selected items provide a sound starting point for further empirical research in this area.

Secondly, our constructs can be grouped into two categories, namely performance enabling and performance driving LCCS project characteristics. This division and the resulting significant coefficients of the data analysis demonstrate how and to which degree the LCCS project characteristics are linked to each other supporting the view that activities need to be prepared and performed in an almost sequential order to yield visible benefits for the project. Thereby, we lay the first step for in-depth exploration and formal modeling of antecedents, phenomena and consequences rather than only descriptive and anecdotal cases as criticized by Quintens et al. (2006b) in their review of global sourcing research.

Thirdly, different to former studies that randomly listed success factors for LCCS, our data revealed the direct or indirect impact of each LCCS project characteristics on LCCS Project Performance. Our study is also unique in using contingency theory to explain the relationships between LCCS project characteristics and performance of LCCS projects. While only the direct effect of *LCCS Project Process Management* is positive and significant, our model shows that the other four LCCS project characteristics influence those processes, thereby having an indirect effect on LCCS Project Performance.

Lastly, our data uncovered potential areas of improvement, at least for the assessed LCCS projects. On the one hand, we showed that the LCCS project's strategic alignment has equal impact on all three drivers and LCCS project's target management has the highest impact on LCCS project's process management. On the other hand, there were always some respondents who strongly agreed (>4.0) to have three of the LCCS project characteristics in place (i.e. 3.7% for *LCCS Project Strategic Alignment*, 5.7% for *LCCS Project Target*

Management, 7.0% for *LCCS Project Process Management*), but only 0.6% of the respondents strongly agreed to have appropriate Structure Management and none of them agreed to have appropriate Skill Management in place. Consequently, we can conclude that these are the characteristics where achieving excellence is most difficult.

In sum, our proposed model and our findings provide managerial and theoretical insights by establishing the importance of critical LCCS project characteristics and the relationship between those characteristics that impact the performance of LCCS projects.

6. Conclusion

Global sourcing in general and LCCS in specific are relevant topics of today's business environment. To succeed in this area and to gain competitive advantage over competitors, understanding the LCCS project characteristics that lead to higher LCCS Project Performance is necessary. With our study, we identified LCCS project characteristics that drive LCCS Project Performance, formulated hypotheses connecting the LCCS project characteristics and performance using contingency theory, and confirmed the hypothesized relationships through the analysis of the data collected. This answered the overarching research question "what drives the performance of LCCS projects and how they can be worked around for achieving the targeted performance?" that was raised in the beginning of this study. Moreover, we assessed the impact of each LCCS project characteristic on LCCS Project Performance. Therefore, we believe that our study makes an important contribution to the existing research on LCCS and global sourcing and provide valuable insights for managers.

On the one hand, by not only exploring and defining successful project characteristics for LCCS, but also linking them to each other and to the resulting LCCS Project Performance, we contribute to closing a research gap in this area and establish ground for further research on this topic. On the other hand, using our model, managers are able to assess their own

LCCS projects and identify improvement areas. As each of the LCCS project characteristics is built up by several underlying items, this model equip managers with a detailed guideline for comparison and evaluation. In addition, the model clearly shows the impact of each LCCS project characteristic on the resulting one, thereby providing practitioners with an understanding of the importance and potential impact of areas like strategic alignment, skill management, target management and structure management. The data also gave indications of potentially higher barriers that have to be tackled to improve the project performance. Thus, applying the model helps in setting benchmarks and providing orientation for future.

The results presented in this paper needs to be seen with its limitations. First, the conceptual framework only covers factors of a project inside the firm and not for the entire firm. In specific, it focuses on LCCS project characteristic that are critical for executing the sourcing. Second, we measure LCCS Project Performance through the perceived satisfaction with the overall project as well as with the achieved savings and the sourcing volume from low-cost countries. We acknowledge that various other internal and external factors can impact LCCS Project Performance. Indeed, 65% of the variance of LCCS Project Performance is due to other internal or external factors that are not covered in the proposed model. Internal factors can be specific to firm, team or a product. At the firm level, one could divide between technology seeking vs. technology protection behavior or firm orientation towards long or short-term relationships (e.g. Petersen et al., 2000). External factors can comprise political and macro-economic conditions and cultural components between supplier and buyer countries. Having acknowledged this limitation, explaining 35% of variance of LCCS Project Performance is significant for a model that merely takes into account internal LCCS project characteristics that is generalizable and can be applied potentially to all LCCS projects. Third, a limited sample from the automotive industry with high support from the CPOs is used for the validation of the model. This implies that the study findings are

potentially limited to a single industry and within this industry exposed to respondents with potentially higher awareness and proficiency level in the topic of LCCS. Also, in our data collection and analysis, we did not account for company or team effects, but only explored the data on the employee level. We did not distinguish between functions nor other criteria of the assessed respondents. Fourth and final, we did not collect data on the nature and characteristics of components sourced from low-cost countries (e.g. life-cycle, absolute price of the sourced component, availability of the component in the market, importance of the component in the overall product, etc). Focus of this study was to understand the performance of overall LCCS project than the performance depending on the nature of component purchased within a project.

Nevertheless, the limitations discussed above also indicate promising directions for future research. One straightforward research path is to investigate broader samples that include companies from additional industries and in different LCCS involvement stages. Extending the current data set, one could also explore differences between various functions, team assessments as well as company-effects. In an effort to understand even more of the variance of LCCS Project Performance, the model should be expanded to include other LCCS project characteristics than those explored in the current model. Another interesting area of future research would be to compare the LCCS project performance model proposed in this study between projects procuring components of different characteristics (e.g. short life-cycle vs. long life-cycle products) from low-cost countries. Limitations notwithstanding, we believe that the findings from this study reveal some interesting and important implications for both managers and academics, providing an incremental contribution to the existing global sourcing literature and serving as a starting building block for research development in the area of LCCS project management.

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Appendix

Appendix 1: Overview of LCCS project characteristics (internal perspective) in the literature published till 2005

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
Monczka & Giunipero (1984)	○ Analyze international purchasing opportunities	○ International purchasing knowledge base ○ Sourcing skills	○ Top management support ○ Measure and evaluate	○ Organization for international purchasing	○ Policy and procedure
Ellram (1991)	○ View purchasing from a global perspective	○ Train buyers in international issues ○ Expand knowledge through intermediaries, or local expertise	○ Distinctive supplier value-added/ contribution ○ Share examples of successes with others	○ Develop local, foreign-based offices/subsidiaries	○ Supplier site visitation ○ Multiple relationships/points of contact between the firm and supplier ○ Establish a task force
Birou & Fawcett (1993)	○ Understand global opportunities ○ Plan for global sourcing	○ Develop global souring/ communication skills; ○ Knowledge of foreign business practices ○ Obtain expert assistance	-	○ Establish foreign buying offices	○ Foreign supplier certification/qualification
Cavusgil, et al. (1993)	○ Vertically coordinated with the company's overall corporate policy ○ Horizontally coordinated with other functional divisions	○ Preparation of manpower training ○ Special managerial skills ○ Logistical knowledge	○ Move toward a system of performance rewards	○ Sourcing configuration (centralized or decentralized) ○ IPOs serve specific tasks	○ Policies and procedures ○ Harmonious, long-lasting relationships between a firm and its supplier network
Rajagopal & Bernard (1994)	○ Identification of cost/resource opportunities	○ Experience in dealing abroad ○ Necessary staff training and development programs	○ Having top management commitment ○ Measuring the benefits gained	○ Establishment of international procurement offices (IPOs)	○ Development of relationship with international suppliers
Fawcett &	○ Planning for global	○ Expert assistance	○ Managerial support	○ Establishing foreign buying	○ Foreign supplier

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
Scully (1994, 1998)	sourcing ○ Understanding global opportunities	○ Communication/ global sourcing skills ○ Knowledge of exchange rates/foreign business practices		offices	certification/qualification ○ Long-term relationships ○ Adequate information technology
Chao (1998)	○ Global outsourcing as an important component of global strategy ○ Country of origin ○ Country image congruency	-	○ Product quality ○ Design quality ○ Parts content display	-	○ Country-of-assembly ○ Country-of-design ○ Parts-source country
Li et al. (2000)	○ Country of origin ○ Perspectives of consumers	○ Enhancing consumers' self-confidence in product purchases ○ Reducing consumer's perception of risk ○ Increasing satisfaction through dissonance reduction	○ Consumer evaluation of quality ○ Functional and symbolic quality evaluation	○ Locations of production and assembly ○ Internal versus external sourcing ○ Locations of R&D ○ Product designs	○ Country-of-corporation ○ Country-of-assembly ○ Country-of-design ○ Warranty
Petersen et al. (2000)	-	○ Foreign language skills ○ Global sourcing business capabilities	○ Top Management Commitment	○ Global organization and focus ○ Global Sourcing Structures	○ Global Sourcing Processes
Zeng (2003)	○ Sourcing strategy ○ Measurement of actual performance	-	○ Performance measurement and continuous improvement ○ Monitor suppliers performance	○ Chain structure design ○ Organizational linkage	○ Dynamic & flexible procurement process
Trent & Monczka (2002, 2003, 2005)	○ Use of cross-functional teams to develop global strategies ○ Regular strategy	○ Availability of needed resources; ○ Involve the right individuals ○ Provide complete	○ Methodologies for measuring savings ○ Ability to measure performance improvements from GS	○ Supportive organizational design; centralized procurement structure	○ Rigorous and well-defined processes

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
	review sessions with worldwide purchasing or other functional managers	information and data to participants	Well-established communication methods		
Insch and McBride (2004)	○ Country of origin	○ Product familiarity	○ Quality – Design, Assembly, Parts, Manufacturing, Other, and Overall	○ Locations of design, parts, and assembly ○	○ Country-of-assembly ○ Country-of-design ○ Parts-source country
Srinivasan et al. (2004)	○ Country of origin	○ Knowledge of perceptions on country-quality relationship of consumers	○ Consumer product evaluations based on quality, branding country, manufacturing country, and price	○ Locations of design, parts, and assembly	○ Manufacturing country ○ Branding country
Quintens et al. (2005)	○ Purchasing internationalization ○ Cost minimization ○ Technological innovativeness ○ Knowledge of language barriers and cultural differences	○ Market research and knowledge ○ Technical import assistance ○ Warehousing and financial risk offsetting	○ Price ○ Quality ○ Availability	○ Swing between decentralization and centralization - Decentralized with central coordination, Centralized structure with limited items purchased decentral, Decentralized with frequent communication, Centralized with close contact to customer	○ Configuration of actors and activities ○ Use of intermediaries such as brokers or agents ○ Use of purchasing consultant and trading companies

Appendix 2 – Interview Protocol

Welcome to this interview. We thank you for agreeing to take part in this research about Low-Cost Country Sourcing (LCCS). Responses to this interview cannot be traced back to you nor to your company. Your responses are going to be combined with those of others and summarized in a report. Therefore, your responses are completely anonymous.

Time Interview Stared: _____

Background Information

Current Job Level: _____

(Choose one - Executive; Top Management/Director; Supervisor; Regular Employee/Staff; Other (please specify))

Current Job Function: _____

(Choose one - Purchasing; Research & Development (R&D); Sales; Manufacturing; Supply Chain/Logistics; Other (please specify))

Years in the Organization: _____

Country of Operation: _____

LCCS Experience (in years): _____

LCCs Sourced: _____

Answer the below questions by keeping in mind the LCCS projects executed by your company

Opening Segment

General Experience with LCCS

1. Summarize your LCCS project experiences so far.
2. Based on your experience so far, what are the drivers of LCCS project success?
3. Based on your experience so far, what are the barriers of LCCS project success?

Middle Segment (Questions of greater specificity)

LCCS Project Strategic Alignment

4. What is your LCCS strategy?
5. To what extent does your LCCS strategy incorporate a holistic view on your global footprint and supply risk exposure?
6. To what extent is the LCCS strategy aligned with your corporate strategy?
7. How did you develop your LCCS strategy, and how is it communicated to the staff?

LCCS Project Skills Management

8. Do you have dedicated LCCS people, and what is their position/responsibility?
9. Which people in your organization are supportive of/resistant to LCCS?
10. Can you describe specific factors related to employees and their motivation to push your company's LCCS performance?

LCCS Project Target Management

11. Do you have clearly defined supplier targets, and are they monitored regularly?
12. To what extent is your LCCS strategy broken down into measurable targets, and how are they being tracked?
13. Which criteria are used to define the strategic LCCS approach per sourcing category/country?

LCCS Project Structure Management

14. How is your purchasing organization structured - business unit, product category, matrix?
15. How do you manage the link between HQ and local entities?
16. How does top management get involved in LCCS decisions?
17. What does your reporting structure for LCCS look like?

LCCS Project Process Management

18. How close and systematically coordinated is LCCS with other functions?
19. How do you run the supplier selection and contract award process for LCCS?

20. Do the LCCS staff push for cross-functional optimization, and are they fully respected as value contributing peers in cross-functional teams?

LCCS Project Performance

21. How do you measure the performance of LCCS projects?
22. What is your current purchasing volume?
23. How much percentage of total purchased volume do you source from LCCs and why?
24. What savings have been achieved through LCCS and how?

Concluding Segment

25. Is there any other important question/information on LCCS project not captured in this interview?
26. Do you have anything else to add to our discussion on LCCS?
27. Do you have any other comments on the interview?

Debrief and note of thanks

Perfect, then we thank you very much for your participation. We are collecting your thoughts in order to gain more insights in LCCS with the aim of developing a LCCS Project Performance Model.

Time Interview Finished: _____

Appendix References

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Figures

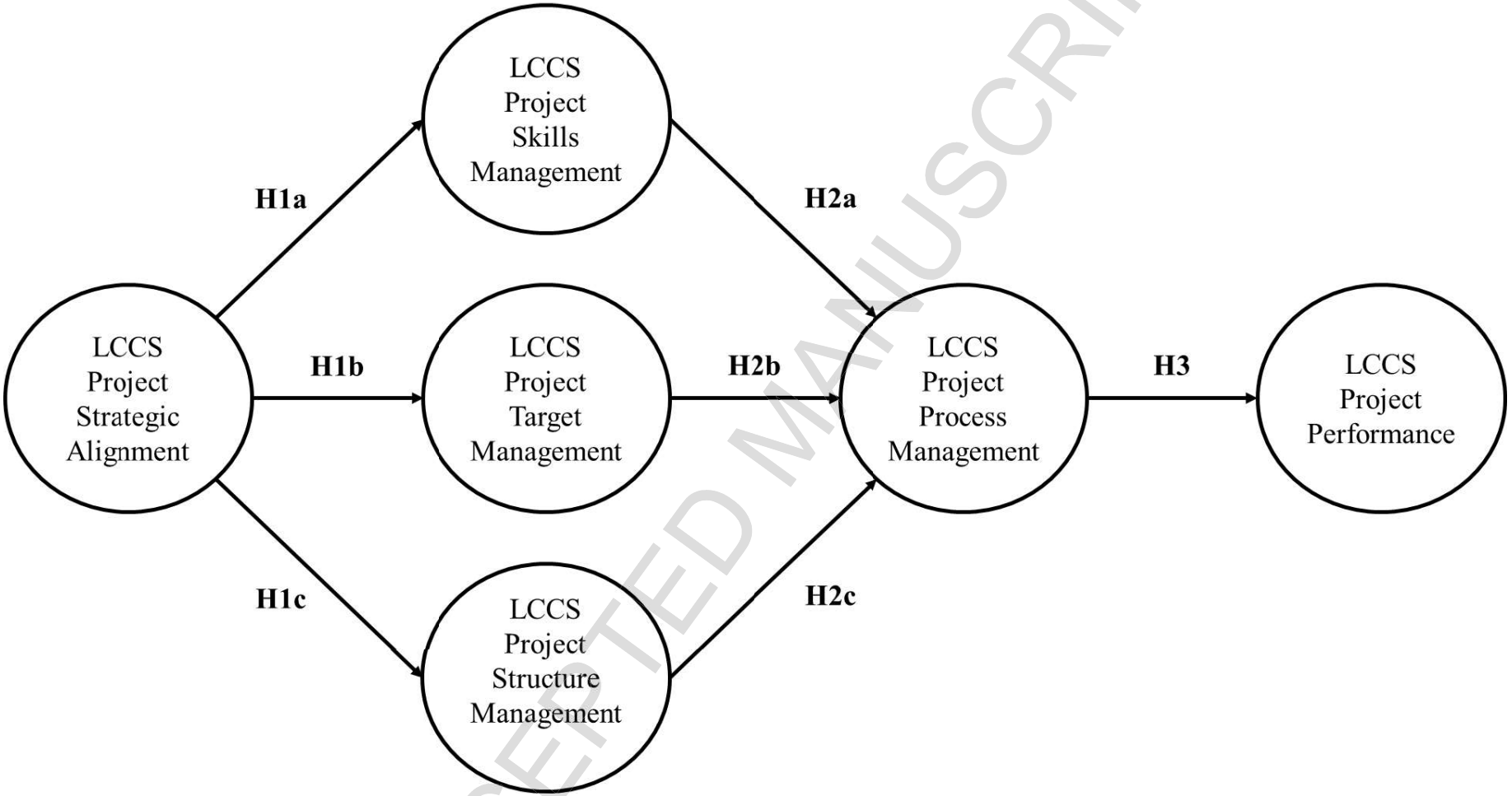

Figure 1: LCCS project performance model

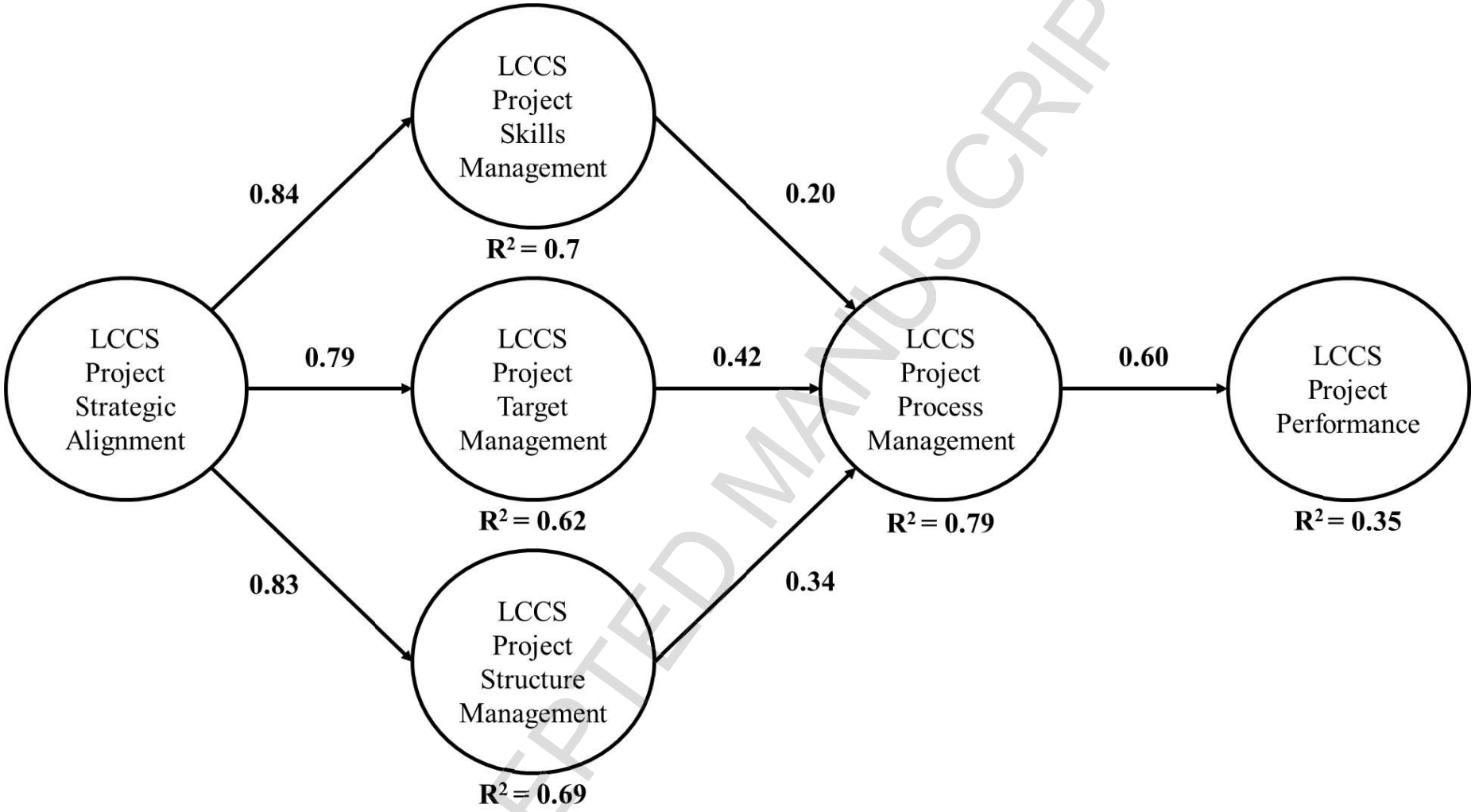

Figure 2: Results of the study

Highlights

1. Performance drivers for low-cost country sourcing (LCCS) projects are identified
2. By interviewing sourcing experts, LCCS Project Performance model is developed
3. Impact of LCCS project characteristics on performance is empirically quantified
4. Strategic alignment drives LCCS project capabilities (skills, target & structure)
5. LCCS project capabilities drive process management & in turn the end performance

Tables

Table 1: Overview of LCCS project characteristics in the literature

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
Holcomb and Hitt (2007)	○ Strategic outsourcing ○ Strategic relatedness ○ Transaction-based and resource-based logics ○ Goal congruency	○ Governance of market exchanges ○ Enable firms to establish, maintain, and use capabilities more efficiently ○ Technological uncertainity ○ Knowledge-sharing routines	○ Cost savings ○ Firm efficiency ○ Coordination costs ○ Switching costs	○ Interorganizational learning between firm and its partners ○ Cooperative experience (repeated ties, direct and indirect)	○ Relational capability building mechanisms
Manning et al. (2008)	○ Global sourcing of science and engineering talent	○ Access to qualified personnel ○ Finding science and engineering talent with advanced degrees (MSc or PhD or their equivalent)	○ Labor cost ○ Skilled talent ○ Service levels ○ Speed to market	○ Global search for talent can impact firm-level strategies and national policies, including education, innovation, and immigration policies	○ Loss of managerial control ○ Concerns about operational efficiency ○ Wage inflation ○ Offshore employee turnover
Fredriksson and Jonsson (2009)	○ Competitive priority	○ Increased flexibility and planning ability ○ Understanding the differences in culture, language, practices, policies and regulations,	○ Product quality ○ Lead time ○ Inventory ○ Reduced costs & investments ○ Market access ○ Proportion of the total purchasing	○ Superior supply network structure configuration ○ Superior supply network relation and coordination ○ Layering and tiering (structuring of information flows and the different coordination	○ Supplier quality consciousness ○ Reliability of delivery, innovativeness, and geographical location ○ Relational factors address the relationship

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
		infrastructure and time zones ○ Match the right product with the right supplier at the right location	value ○ Geographic distance ○ Delivery time& precision	options of the physical operations, the links, and the localization of nodes) ○ Role of plants (nodes)	between the activity being sourced and other activities within the value chain ○ Frozen schedules
Hätönen and Eriksson (2009)	○ Transformational outsourcing ○ Strategic and competitive edge ○ Portfolio management	○ Capability enhancement ○ Highly knowledge-intensive ○ Creative	○ Cut costs ○ Dynamic competences ○ Profit maximizing	○ Arms-length transactions ○ Network competences	○ Process improvement ○ Organizational transformation ○ Strategic alliances ○ Collaborative development
Javalgi et al. (2009)	○ Strategic & transformational outsourcing for competitive advantage ○ Outsourcing core/non-core activities & complementary resources	○ Building resources and capabilities ○ Knowledge and innovation for transformation ○ Knowledge of geographical distance, laws, tax, and culture	○ Cost reduction ○ Transaction frequency ○ Economies of scale ○ Price for customer ○ Exports & Global Competitiveness	○ Value creation across business functions ○ Collaboration for better efficiencies	○ Process capabilities across organizational boundaries ○ Staying close to manufacturer
Varadarajan (2009)	○ Partial, micro, reciprocal, & quasi horizontal & Co-outsourcing	○ Outsourcing to meet demand spikes ○ Knowledge intensive activities ○ Potential impact	○ Market & technology access ○ Cost ○ Customer relationship	-	○ Current or new suppliers ○ Single or multiple sources ○ Within or offshore ○ Strategic alliance partners

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
		of technology			○ Direct, peripheral, & potential competitors ○ Intermediate & end use customers
Ruamsook et al. (2009)	○ LCC comparitive advantage ○ Strategic international sourcing	○ Manufacturer and supplier capability ○ Business environment (e.g. laws, political stability, exchange rate fluctuation, and domestic market nationalism) ○ Local logistics industry competence	○ Transportation and logistics costs ○ On-time receipt ○ Length & consistency of cycle-time ○ Safety stock levels ○ Accurate invoice ○ Delivery damage ○ Product price	○ Communication infrastructure, network and information technology	-
Contractor et al. (2010)	○ Global outsourcing & insourcing	○ Access to external knowledge to understand foreign markets ○ Build legitimacy with local customers and governments	○ Cost reduction ○ Foreign market access	○ Core of the value chain are retained in-house ○ Non-core segments are optimally dispersed geographically (offshoring) over allies and contractors (outsourcing)	○ Reconsideration of core activities to be retained internally ○ Conducting processes cooperatively with partners ○ Market transaction with arms-length provider
Kumar et al. (2010)	○ Low cost country sourcing logistics	○ Knowledge on region specific	○ Total Cost of Ownership	○ Product and supplier related logistics factors	○ International supplier selection

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
		○ factors such as transportation infrastructure and logistic services availability ○ Country characteristics and culture closeness	○ On-time delivery ○ Delivery reliability ○ Lot size/batch quantity ○ Quality failures ○ Cost of replacing defects ○ Customer good will	○ Educating supplier ○ International purchasing office ○ Sourcing through subsidiaries	○ Pre-transaction (source verification, etc.) transaction (inspection cost, etc.), & post-transaction (quality failures, etc.) process
Weber et al. (2010)	○ LCCS strategy	○ Language barriers ○ Intercultural communication ○ Risk analysis ○ Failure management	○ Total cost of ownership & activity based costing ○ Purchase price ○ Testing & sampling cost	○ Definition of specifications ○ Technical clarification ○ Communication	○ Evaluation of potential supplier ○ Supplier selection ○ Sampling and inspection ○ Transit insurance
Christopher et al. (2011)	○ Assessing and mitigating supply chain (SC) risk in a global context	○ Global sourcing continuity teams ○ Risk management and mitigation culture	○ Risk of supply & demand, process & control, and sustainability ○ Cost, quality, speed & flexibility ○ New technologies & markets access	○ Board-led responsibility and leadership	○ Supply base network re-engineering ○ Re-evaluating sourcing criteria and decisions
Holweg et al. (2011)	○ Global sourcing as part of a firm's purchasing strategy	○ Comprehensive risk and cost assessment ○ Currency fluctuations ○ Loss of IPR to contractors	○ Cost of Transportation, energy, and labour ○ Lead time ○ Service level ○ Demand uncertainty	-	○ Foreign supplier selection process

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
		○ Component complexity	○ Cost of expediting		
Kusaba et al. (2011)	○ LCCS strategy content development & alignment	○ LCCS competence ○ Integrating skilled people	○ LCCS execution ○ Use of advanced information systems	○ Development of the required support structure	○ Capabilities required to motivate and secure organization support ○ LCCS supplier management
Horn et al. (2013)	○ Perceived competitive advantage in low-wage-country sourcing	○ International trade difficulties ○ Importance of raw material, currency hedging, & customs issues ○ Cultural differences in understanding contracts	○ Annual cost & savings of LCCS components ○ Failure rates ○ Plant breakdowns	○ Quality, logistics, and R&D function ○ LCCS interface managers ○ Differing incentive systems	○ E-procurement ○ Supplier integration & JIT ○ ISO-standards ○ Integrated decision-making & target-tracking
Najafi et al. (2013)	○ Emerging country sourcing ○ International sourcing	○ Commitment in emerging markets ○ Market, knowledge and technology access ○ Distribution of purchasing expertise among subsidiaries	○ Cost of sourcing and labor ○ Degree of product innovation	○ Strategic network context surrounding each buyer-supplier relationship ○ Control mechanism is influenced by corporate organizational structure	○ Three approaches – (a) transactional for individual sourcing, (b) supply base for establishing supplier relationships, & (c) network positioning for developing supplier-customer relationships
Schneider et al. (2013)	○ Global sourcing ○ Strategic	○ Relationship continuity	○ LCCS share of annual purchasing	○ Alignment of governance structure - highly	○ Transaction cost economics

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
	procurement	○ Trust propensity		integrated (hierarchical) & loosely integrated (close to market conditions)	○ Distant and close suppliers
Steven et al. (2014)	○ Global offshoring & outsourcing ○ Production relocation ○ Consolidate supply bases	○ Managing supply base concentration	○ Product recalls ○ Outsourcing & offshoring intensity	○ Geographical/national concentration of a firm's subsidiaries	○ Outsourcing to smaller supplier base
Tate (2014)	○ Reshoring ○ Offshoring	○ Knowledge of oil price fluctuation ○ Awareness of global SC risk ○ Physical & cultural differences ○ IPR theft	○ Improved cost performance ○ Transportation costs	○ Shorter SC for easy innovation and product changes	-
Hanna and Jackson (2015)	○ Strategic impact ○ Competitiveness ○ Long-term implications for innovation	○ Capability fit ○ Information asymmetry	○ Lead time ○ Quality inspection cost ○ Working capital requirements	○ Effective SC relationships	○ Management of operations and satisfying customers
Lorentz et al. (2015)	○ LCCS	○ Sourcing friendliness ○ Distant and culturally different locations ○ IPR protection	○ SC administration cost ○ Product cost structure	○ SC administration ○ Required communication and coordination	○ Transportation & new materials management methods ○ Suppliers' manufacturing competencies

Source	Strategic Alignment	Skills Management	Target Management	Structure Management	Process Management
Gelderman et al. (2016)	○ Global sourcing strategies integrated across worldwide locations and function groups	○ Personnel with the knowledge and skills to coordinate global sourcing	○ International sourcing volume ○ Purchasing from non-domestic supplier	○ Centralized procurement ○ Coordinate the global sourcing activities from one central location	○ Critical incidents - opportunistic response to unforeseen events
Gleich et al. (2016)	○ Competitive position	○ Knowledge on investment of domestic competitors and foreign rivals	○ Ratio of international service sourcing to total global sales	○ Domestic competitors pressure ○ Outsourcing downstream activities ○ International diversification	○ Collocating production ○ Redesign a service firm's international value chain
Lahiri (2016)	○ Congruence between firms' outsourcing drivers and competitive priorities	○ Trust, cooperation & communication ○ Capability building including innovation	○ % of input from foreign suppliers ○ Extent of sales internationalization ○ Change in current outsourcing budget in last three years	○ Control mechanisms ○ Vertical integration	○ Assessment of the effectiveness of outsourcing process
Vos et al. (2016)	○ Low wage country suppliers	○ Influence of labor content in products ○ Learning curve effect	○ Total cost of ownership & its reduction ○ Market price dispersion ○ Reputation	○ Induce competitive dynamics	○ Stringent pre-selection & consolidation of capable suppliers ○ Newly sourced & straight rebuy items

Table 2: Examples of LCCS project performance measures

Performance measures	Sub-measure
Product's market performance	Product's relative market share Product's pretax profitability
Strategic dimensions of market performance	Market share relative to the product's three largest competitors Sales growth rate relative to the product's three largest competitors
Financial dimensions of market performance	Return on sales relative to the product's three largest competitors Return on investment relative to the product's three largest competitors (Return on equity relative to the product's three largest competitors)
Quality dimension of service performance	Service quality relative to the product's three largest competitors Service value relative to the product's three largest competitors
International Sourcing Performance Construct	International sourcing has led to an above average rate of growth in (1) return on total assets (2) sales (3) market share for your firm Your firm's international sourcing activities have helped it achieve above average (4) cost reductions (5) levels of product quality Global sourcing has resulted in an above average improvement in your firm's overall competitive position
Global sourcing effectiveness	Effectiveness of business unit's/company's global purchasing strategies/practices Effectiveness of business unit's/company's global SC strategies/practices
Perceived impact of international sourcing	Proportion of total purchasing dollar paid to international sources International sourcing practices Future of international sourcing Satisfaction with heir firm's international sourcing performance

Source: Kotabe (1992); Murray et al. (1995); Kotabe et al. (1998); Petersen et al. (2000); Samli & Browning (2003); Mol et al. (2005); Holcomb and Hitt (2007); Manning et al. (2008); Fredriksson and Jonsson (2009); Hätönen and Eriksson (2009); Javalgi et al. (2009); Ruamsook et al. (2009); Varadarajan (2009); Christopher et al. (2011); Contractor et al. (2010); Horn et al. (2013); Schneider et al. (2013); Steven et al. (2014); Hanna and Jackson (2015); Lorentz et al. (2015); Gelderman et al. (2016); Gleich et al. (2016); Lahiri (2016); Vos et al. (2016);

Table 3: Construct definitions and underlying indicators with supporting literature

Constructs and indicators	Literature
LCCS Project Strategic Alignment - *LCCS Project Strategic Alignment is defined as the degree of alignment of LCCS project with the corporate objectives, the overall sourcing strategy and other functional strategies (Trent & Monczka, 2005; Quintens et al., 2006a & b; Rizza, 2007).*	
o Clearly outlined LCCS potential for sourcing portfolio	Trent & Monczka (2005); Quintens et al. (2006a & b)
o Differentiated strategy for commodities	Murray et al. (1995)
o Alignment with purchasing strategy	Rizza (2007)
o Alignment with corporate strategy	Rizza (2007)
o Alignment with business units/functional strategies	Rizza (2007)
LCCS Project Skills Management - *LCCS Project Skills Management is defined as the management of broad set of skills necessary for smooth execution of LCCS project (e.g. specific knowledge of the supplier base capabilities in different countries, contextual business intelligence, cross-cultural communication and negotiation expertise, knowledge of international logistics and customs processes, currency exchange rate developments, etc.) (Petersen et al., 2000; Faes et al., 2001; Quintens et al., 2006b).*	
o Expertise about relevant LCC supplier markets	Quintens et al. (2006b)
o Available skills in project teams	Petersen et al. (2000); Faes, et al. (2001); Trent & Monckz (2005)
o Presence of adequate LCCS trainings	Quintens et al. (2006b)
o Integrated cross-functional expertise beyond team structure	Johnson, et al. (2002)
LCCS Project Target Management - *LCCS Project Target Management is defined as the management of LCCS project's progress to achieve the initially set target by regular measurement of the benefits gained from each LCCS effort and communication of success stories to involved partners (Faes et al., 2000; Trent & Monczka, 2005; Quintens et al., 2006b; Fredriksson & Jonsson, 2009).*	
o Communication of LCCS project aspirations	Faes et al. (2000); Trent & Monczka (2005)
o Tracking of LCCS performance progress	Trent & Monczka (2005)
o Tracking of supplier performance	Quintens et al. (2006b); Fredriksson & Jonsson (2009)
LCCS Project Structure Management - *LCCS Project Structure Management is defined as the management of structural prerequisites such as sourcing structures to attain global sourcing business capabilities, defining roles as well as responsibilities, separating strategic and operational activities, forming cross-functional global sourcing project teams, etc. for smooth implementation of LCCS projects (Petersen et al., 2000; Trent & Monczka, 2005; Forrest, 2005; Flynn et al., 2010).*	
o Clear responsibility and expected contribution of the team member	Trent & Monczka (2005)
o Defined relationships between	Trent & Monczka (2005)

departments within team structure	
○ Efficient and lean LCCS organization	Petersen et al. (2000); Forrest (2005)
LCCS Project Process Management - *LCCS Project Process Management is defined as the management of processes in charge of transforming strategy and enablers into action between the buyer and the low cost country supplier. The processes include supplier identification, supplier evaluation, supplier selection, supplier involvement through regular communication, suppliers designing and building entire subassemblies and subsystems for purchaser, etc. (Tracey & Tan, 2001; Sarkis & Talluri, 2002; Quintens et al., 2006b; Fredriksson & Jonsson, 2009; Hätönen & Eriksson, 2009).*	
○ Supplier identification, evaluation and selection process	Sarkis & Talluri (2002), Quintens et al. (2006b)
○ Negotiation process with potential suppliers	Tracey & Tan (2001)
○ Successful business relationships management	Fredriksson & Jonsson (2009)
○ Joint task forces for process improvement projects	Hätönen & Eriksson (2009)
LCCS Project Performance - *LCCS Project Performance is defined as the impact of LCCS on the performance of the project measured as improvements in performance objectives, proportion of procurement using LCCS, and savings captured through LCCS (Petersen et al., 2000; Samli & Browning, 2003; Fredriksson & Jonsson, 2009; Kusaba et al., 2011).*	
○ Satisfied with our overall LCCS project performance	Kusaba et al., 2011; Samli & Browning (2003); Petersen et al. (2000)
○ Satisfied with the share of purchasing volume that is sourced from low-cost countries	Kusaba et al., 2011; Samli & Browning (2003)
○ Satisfied with the savings that we are capturing by shifting sourcing volume to low-cost countries	Samli & Browning (2003); Fredriksson & Jonsson (2009)

Table 4: Survey respondent profile

	Frequency	Percent	Cumulative Percent
Current Job Level			
Executive	4	2.26	2.26
Top Management/ Director	20	11.30	13.56
Supervisor	54	30.51	44.07
Regular Employee/ Staff	99	55.93	100.00
TOTAL	**177**	**100.00**	
Current Job Function			
Purchasing	89	50.28	50.28
R&D	28	15.82	66.10
Manufacturing	12	6.78	72.88
Supply Chain/ Logistics	22	12.43	85.31
Others (Quality, Engineering etc.)	26	14.69	100.00
TOTAL	**177**	**100.00**	
Years in Organization			
Less than a Year	6	3.39	3.39
1-2 Years	8	4.52	7.91
3-5 Years	24	13.56	21.47
6-10 Years	52	29.38	54.76
11-20 Years	53	29.94	84.73
Over 20 Years	34	19.21	100.00
TOTAL	**177**	**100.00**	
LCCS Project Experience			
Remote business communication with LCCS suppliers	89	50.28	50.28
Regular business trips to targeted LCCS regions	45	25.42	75.71
Short assignment(s) in a targeted LCCS region(s)	23	12.99	88.70
Expatriate in targeted LCCS region(s)	6	3.39	92.08
Lived in targeted LCCS region(s) for many years	7	3.95	96.03
Was born in one of targeted LCCS regions	7	3.95	100.00
TOTAL	**177**	**100.00**	

Table 5: Overview of indicators and measures of reliability and validity

	Constructs and indicators	Outer loadings	
		Point estimate	**t-value**
LCCS Project Strategic Alignment (α = 0.86; AVE = 0.65; CR = 0.90)			
SS1	LCCS potential for sourcing portfolio	0.81	30.93
SS2	Differentiated strategy for commodities	0.71	14.01
SS3	Alignment with PSM	0.85	41.15
SS4	Alignment with corporate strategy	0.88	46.69
SS5	Alignment with business units/functions	0.76	20.93
LCCS Project Skills Management (α = 0.70; AVE = 0.53; CR = 0.82)			
SM1	Familiarity with relevant LCC suppliers	0.71	14.72
SM2	Right people with the right skills	0.83	33.86
SM3	Adequate trainings available	0.69	12.74
SM4	Cross-functional support & expertise leveraged	0.68	13.45
LCCS Project Target Management (α = 0.67; AVE = 0.60; CR = 0.82)			
TM1	Communication of LCCS aspirations	0.72	12.87
TM2	Tracking of LCCS performance progress	0.80	22.98
TM3	Tracking of supplier performance	0.81	30.12
LCCS Project Structure Management (α = 0.75; AVE = 0.67; CR = 0.86)			
PS1	Responsibility and contribution	0.81	25.01
PS2	Defined relationship between departments	0.88	46.69
PS3	Efficient and lean LCC sourcing organization	0.76	18.80
LCCS Project Process Management (α = 0.83; AVE = 0.67; CR = 0.89)			
LP1	Supplier selection process	0.81	25.13
LP2	Contacting process of potential suppliers	0.81	21.73
LP3	Successful business relationships	0.84	44.70
LP4	Joint task forces	0.81	26.38
LCCS Project Performance (α = 0.73; AVE = 0.65; CR = 0.85)			
PP1	Overall satisfaction	0.84	30.19
PP2	Satisfaction with LCCS purchasing volume	0.80	18.39
PP3	Satisfaction with LCCS savings captured	0.77	21.68

Table 6: Cross loadings

	LCCS Project Strategic Alignment	LCCS Project Skills Management	LCCS Project Target Management	LCCS Project Structure Management	LCCS Project Process Management	LCCS Project Performance
SS1	**0.81**	0.70	0.67	0.69	0.70	0.49
SS2	**0.71**	0.57	0.52	0.61	0.55	0.46
SS3	**0.85**	0.73	0.71	0.66	0.68	0.31
SS4	**0.88**	0.72	0.69	0.70	0.71	0.32
SS5	**0.76**	0.64	0.55	0.67	0.60	0.37
SM1	0.62	**0.71**	0.46	0.54	0.57	0.50
SM2	0.71	**0.83**	0.67	0.72	0.71	0.45
SM3	0.55	**0.69**	0.62	0.46	0.49	0.26
SM4	0.55	**0.68**	0.56	0.66	0.58	0.45
TM1	0.57	0.50	**0.72**	0.54	0.49	0.41
TM2	0.65	0.70	**0.80**	0.59	0.58	0.28
TM3	0.61	0.63	**0.81**	0.56	0.82	0.53
PS1	0.65	0.63	0.52	**0.81**	0.63	0.37
PS2	0.70	0.72	0.61	**0.88**	0.70	0.50
PS3	0.69	0.67	0.64	**0.76**	0.66	0.43
LP1	0.71	0.65	0.66	0.69	**0.81**	0.38
LP2	0.62	0.64	0.59	0.61	**0.81**	0.35
LP3	0.69	0.69	0.71	0.73	**0.84**	0.59
LP4	0.61	0.67	0.72	0.62	**0.81**	0.58
PP1	0.49	0.52	0.47	0.52	0.51	**0.84**
PP2	0.29	0.36	0.45	0.28	0.44	**0.80**
PP3	0.37	0.48	0.36	0.46	0.49	**0.77**

Table 7: Squared correlations between constructs (with AVE on the diagonal)

		(1)	(2)	(3)	(4)	(5)	(6)
LCCS Project Strategic Alignment	(1)	**0.65**					
LCCS Project Skills Management	(2)	0.70	**0.53**				
LCCS Project Target Management	(3)	0.62	0.62	**0.60**			
LCCS Project Structure Management	(4)	0.69	0.68	0.52	**0.67**		
LCCS Project Process Management	(5)	0.65	0.66	0.68	0.66	**0.67**	
LCCS Project Performance	(6)	0.23	0.33	0.28	0.28	0.35	**0.65**

Table 8: Path coefficients and variance explained of structural model

Constructs and indicators	Path coefficients	
	Point estimate	t-value
LCCS Project Skills Management (R^2= 0.70)		
LCCS Project Strategic Alignment → SM	0.84*	32.14
LCCS Project Target Management (R^2= 0.62)		
LCCS Project Strategic Alignment → TM	0.79*	22.99
LCCS Project Structure Management (R^2= 0.69)		
LCCS Project Strategic Alignment → PS	0.83*	24.86
LCCS Project Process Management (R^2= 0.79)		
LCCS Project Skills Management → LCCS Project Process Management	0.20*	3.53
LCCS Project Target Management → LCCS Project Process Management	0.42*	6.34
LCCS Project Structure Management → LCCS Project Process Management	0.34*	6.77
LCCS project performance (R^2= 0.35)		
LCCS Project Process Management → LCCS Project Performance	0.60*	13.67

*Significant at 0.01 level

Table 9: Means of high performing group (25%)

	N	Mean	Standard deviation	Min	Max
LCCS Project Strategic Alignment	31	3.33	0.84	1.40	5.00
LCCS Project Skills Management	31	2.90	0.54	2.00	4.00
LCCS Project Target Management	32	3.41	0.96	1.00	5.00
LCCS Project Structure Management	31	2.88	0.86	1.00	4.67
LCCS Project Process Management	31	3.52	0.62	2.25	5.00
LCCS Project Performance	32	3.75	0.52	3.33	5.00

Table 10: Means of low performing group (25%)

	N	Mean	Standard deviation	Min	Max
LCCS Project Strategic Alignment	39	2.31	0.82	1.00	4.00
LCCS Project Skills Management	41	2.08	0.74	1.00	3.50
LCCS Project Target Management	43	2.47	0.80	1.00	4.00
LCCS Project Structure Management	41	2.24	0.76	1.00	4.00
LCCS Project Process Management	37	2.46	0.89	1.00	4.50
LCCS Project Performance	43	1.81	0.34	1.00	2.00

Table 11: Means of total

	N	Mean	Standard deviation	Min	Max
LCCS Project Strategic Alignment	163	2.83	0.82	1.00	5.00
LCCS Project Skills Management	168	2.47	0.69	1.00	4.00
LCCS Project Target Management	174	2.99	0.90	1.00	5.00
LCCS Project Structure Management	166	2.61	0.74	1.00	4.67
LCCS Project Process Management	157	2.98	0.85	1.00	5.00
LCCS Project Performance	170	2.68	0.73	1.00	5.00